2020 XtendFlex Technology Cotton Variety Trial – Adobe Walls Gin

Travis Patterson Farm
Spearman, TX

Dr. Randy Boman, Cotton Agronomics Manager – Windstar Inc.

Jerrell Key, Adobe Walls Gin Manager

Doug Kennedy, Assistant Manager

Summary

In 2019, a cotton variety testing program was established as a new service created by Windstar Inc. affiliated gins. These gins are working together to support a Cotton Agronomics Manager position. One of the components of this program is to work with local producers to scientifically evaluate varieties in a commercial on-farm setting from planting through ginning. These unique replicated trials are planted and harvested with the grower's commercial equipment. Each variety's round modules are combined across all replicates and then ginned and classed separately in an extremely detailed manner. Purging and weighing any remnant bale of from the press is also performed for each variety. All lint samples from each variety's commercial bales are then classed by the USDA-AMS classing office. This detailed ginning and classing management of all round modules for each variety is key to the success of this program and to the best of our knowledge is without peer in the U.S. ginning industry.

At this site in 2020, six varieties with Bollgard 3 XtendFlex technology were planted in a center-pivot irrigated field in a scientifically valid trial with three replicates. *This trial escaped significant damage associated with the June 9th regional high wind event. However, it did sustain some minor hail damage from a hail associated with a thunderstorm event in July. Otherwise, the trial was able to stay on track with growth and development until the September 9th record low temperature. Visually, it appeared to escape any damage associated with the cold spell, but the overall impact of these factors apparently negatively affected maturity.*

Harvest results indicated that statistically significant differences were observed. Lint yields ranged from a high of 1829 lb/acre (NexGen 2982 B3XF) to a low of 1450 lb/acre (DP 2020 B3XF), and averaged 1640 lb/acre (Table 1). Average Loan value for varieties from commercially ginned and classed bales varied from a high of $0.4713/lb (DP 1820 B3XF) to a low of $0.2222/lb (NG 2982 B3XF). Overall Loan value for the trial across all entries was 0.3876/lb. When including lint Loan value on a per acre basis and net gin credit, statistically significant differences were found in net value/acre among varieties. DP 1820 B3XF had the highest net value at $927/acre, and NG 2982 B3XF had the lowest at $527/acre. Although NG

2982 B3XF had the highest yield on a per acre basis among varieties evaluated, its low quality drastically reduced its gross loan value on a per acre basis.

Table 2 presents in-season data including stand establishment percentage, vigor, nodes above white flower (NAWF) and plant height on three sampling dates, nodes above cracked boll (NACB) on September 30, and a visual estimate of storm resistance. NACB values for most varieties were very high on September 30, and averaged 7.0. This indicates that a considerable number of unopened bolls were being pushed into October to gain additional maturity. Even though NexGen 2982 B3XF had the lowest value of 3.9 NACB on that date, it still exhibited a low micronaire value of 3.0. It is unclear why this may have occurred; however, the September cold spell may have adversely affected the sugar to cellulose conversion that occurs in the fiber.

Table 3 provides the USDA-AMS classing results from each commercial bale for each variety and the variety averages. Averages indicate that color grades were typically 31, 41 or lower quality across entries. The eleven commercial bales of NexGen 2982 B3XF had the lowest color grade quality, and all exhibited a 51 color. Leaf grades ranged from about 4 to 8. NexGen 2982 B3XF had the lowest leaf grade quality, again with all 11 commercial bales classed as leaf grade 8. Staple ranged from an average high of 39.4 (DP 1820 B3XF) to an average low of 36.8 32nds inch (DP 2012 B3XF). Micronaire was apparently significantly affected by the September 9 cold spell. Average micronaire values ranged from a high of 3.1 (DP 1820 B3XF and NG 3930 B3XF) to a low of 2.8 (DP 2020 B3XF). Significant bark contamination was noted in commercial bales. Bark incidence ranged from a low of 55% of bales (DP 1820 B3XF) to a high of 100% (DP 2012 B3XF). Other entries had 89% or greater bark incidence. Fiber strength ranged from a high of 32.9 g/tex to a low of 28.9 g/tex. Uniformity ranged from a high of 81.8% to a low of about 79.4%.

Disclaimer: Readers should realize that results from one trial do not represent conclusive evidence that the same response would occur where conditions vary. Multi-site and multi-year data are always best. For this trial, good scientific techniques were used and the results are presented to indicate what actually occurred in the trial. Context of the environment, overall growing season impact, management techniques, and trial methodology used are important and must be considered.

Site Information and Methods

Elevation: 3160 ft

Previous crop: sorghum hay in 2019

Tillage system: disk of residue, strip-till

Planted: May 5

Replicates: 3 replicates in a randomized complete block design

Plot width: 12-row plots

Plot length: trial was planted in straight rows; ~1,600 ft for long rows and ~1400 ft for short rows

Seeding rate: 65,000 seed/acre

Days from planting to first bloom: 70 (July 10)

30-inch rows under center pivot irrigation

Total irrigation May through August: ~12 inches

Approximately 3 inches per month for May, June, July, and August

Fertility management:

65 lb/acre N, 35 lb/acre P_2O_5, 5 lb/acre S, 1 lb/acre Zn

Chemical Applications:

Preemergence – 1 qt/acre Gramoxone + 10 oz/acre dicamba qt/acre Direx (diuron)

Post emergence – 22 oz/acre Stalwart (metolochlor)

Post emergence – 1 qt/acre Liberty + 10 oz/acre dicamba

Plant growth regulators: 2 oz/acre Stance at match head square, 16 oz/acre mepiquat chloride at 10-12 nodes, 32 oz/acre mepiquat chloride prebloom, 32 oz/acre mepiquat chloride mid-bloom

Insecticides: none

Harvest aid application: Mid-October – 1 qt/acre ethephon (Boll'd) + 1 pt/acre tribufos (Folex)

Harvesting: November 12 using a John Deere CS690, with harvested area calculated by the GPS on the stripper monitor. Entire plot length was harvested with 2 round modules harvested/plot. Round modules were weighed using the CS690 scale, and all round modules from individual plots were weighed at the Adobe Walls Gin.

Commercial ginning: Round modules for all 3 reps of each variety were staged together (2 per plot, with 3 reps = 6 total per variety) and commercially ginned separately by Adobe Walls Gin. Commercial ginning included: cleaning module feeder, clearing gin stream, dumping seed rolls, and purging remnant bale in press. This process was initiated before the first variety module was ginned and then repeated for each variety module in trial.

Remnants were ejected from the bale press and weighed, but not sampled for USDA-AMS classing. Only data from commercial bales are included in classing data for each variety.

Lint value: Table 1 is based on CCC Loan value from commercial ginning and USDA-AMS classing results.

List of Tables

Appendix – Amarillo 2020 cotton heat units and weather data.

Acknowledgements

Adobe Walls Gin would like to thank Travis Patterson for committing equipment, land, and time to conduct and manage the trial. Shawn Dehaan performed harvesting operations and we appreciate his excellent assistance. Gratitude is expressed to participating seed companies for providing testing seed. These include Deltapine, NexGen, and Stoneville. Gratitude is also expressed to Windstar Inc. Detailed ginning was performed by the Adobe Walls crew and a big thank you is extended to this hard-working group.

ADOBE WALLS GIN

2020 XtendFlex Trial Variety Descriptions – Adobe Walls Gin

Travis Patterson Farm
Spearman, TX

Dr. Randy Boman
Cotton Agronomics Manager

Variety Descriptions from Company Literature and Websites

DP 1820 B3XF Roundup Ready Flex (glyphosate), Liberty Link (glufosinate), and dicamba stacked herbicide tolerance technologies stacked with Bollgard 3 Bt technology. Early-medium maturity. Semi-smooth leaves, medium-tall plant height, storm resistance 3.5 (on scale of 1 = tight, 9 = loose). ~ 39 staple, strength ~30.6 g/tex. Disease ratings: Fusarium wilt – moderately susceptible, Verticillium wilt – moderately susceptible, Bacterial blight – resistant.

DP 2012 B3XF Roundup Ready Flex (glyphosate), Liberty Link (glufosinate), and dicamba stacked herbicide tolerance technologies. Early maturity. Smooth leaves, medium to medium-tall plant height, storm resistance 3.5 (on scale of 1 = tight, 9 = loose). ~ 38 staple, strength ~31.3 g/tex. Disease ratings: Fusarium wilt – no data, Verticillium wilt – moderately tolerant, Bacterial blight – resistant.

DP 2020 B3XF Roundup Ready Flex (glyphosate), Liberty Link (glufosinate), and dicamba stacked herbicide tolerance technologies. Early-medium maturity. Semi-smooth leaves, medium to medium-tall plant height, storm resistance 3.5 (on scale of 1 = tight, 9 = loose). ~ 37.7 staple, strength ~30.3 g/tex. Disease ratings: Fusarium wilt – no data, Verticillium wilt – moderately tolerant, Bacterial blight – resistant.

NG 2982 B3XF Roundup Ready Flex (glyphosate), Liberty Link (glufosinate), and dicamba stacked herbicide tolerance technologies stacked with Bollgard 3 Bt technology. Early maturity. Storm tolerance 9 (scale of 0 = very loose, 9 = very storm tolerant), leaf hair semi-smooth, plant height medium, node of first fruiting branch (avg) 7, staple 36-37, strength 31-33. Diseases (on scale of 0 very susceptible, 9 superior resistance): Fusarium wilt - no data, Verticillium wilt 7, Bacterial blight 9.

NG 3930 B3XF Roundup Ready Flex (glyphosate), Liberty Link (glufosinate), and dicamba stacked herbicide tolerance technologies stacked with Bollgard 3 Bt technology. Early-Medium maturity. Storm tolerance 7 (scale of 0 = very loose, 9 = very storm tolerant), leaf hair semi-smooth, plant height medium-tall, node of first fruiting branch (avg) 6.7, staple 37-38, strength 29-30. Diseases (on scale of 0 very susceptible, 9 superior resistance): Fusarium wilt - no data, Verticillium wilt 7, Bacterial blight 8.

ST 4480 B3XF Roundup Ready Flex (glyphosate), Liberty Link (glufosinate), and dicamba stacked herbicide tolerance technologies. Early-medium maturity. Semi-smooth leaves, medium plant height, storm resistance 6 (on scale of 0 = very loose, 9 = very storm tolerant). ~ 37.7 staple, strength ~31.1 g/tex. Disease ratings: Root knot nematode/Fusarium wilt – fair, Verticillium wilt – fair, Bacterial blight – resistant.

ADOBE WALLS GIN

Table 1. Harvest results for the center pivot irrigated XtendFlex cotton variety trial, Patterson Farm, Spearman, TX, 2020.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint loan value	Net gin credit	Net value	
	---------- % ----------		---------- lb/acre ----------			$/lb	---------- $/acre ----------			
DP 1820 B3XF	29.3	43.8	6075	1781	2660	0.4713	839	88	927	a
NG 3930 B3XF	27.1	47.0	6406	1739	3011	0.4322	752	114	866	b
DP 2012 B3XF	26.0	43.7	5724	1487	2502	0.4147	617	82	699	c
ST 4480 B3XF	25.0	40.8	6207	1551	2532	0.3763	584	71	654	cd
DP 2020 B3XF	25.5	39.2	5691	1450	2228	0.4088	593	55	647	d
NG 2982 B3XF	27.4	47.2	6687	1829	3153	0.2222	406	120	527	e
Test average	26.7	43.6	6132	1640	2681	0.3876	632	88	720	
CV, %	--	--	3.1	3.5	3.2	--	4.9	3.7	4.7	
OSL	--	--	0.0004	0.0001	0.0001	--	0.0001	0.0001	0.0001	
LSD	--	--	278	85	126	--	46	5	50	

For net value/acre, means within a column with the same letter are not significantly different.
CV - coefficient of variation.
OSL - observed significance level, or probability of a greater F value.
LSD - least significant difference at the 0.10 level, NS - not significant.
Note: some columns may not add up due to rounding error.

Assumes:
$3.15/cwt commercial ginning cost.
$210/ton for seed.
Net gin credit is defined as seed credit minus ginning expense.
Value for lint based on CCC loan value from commercial ginning and USDA-AMS classing results.

ADOBE WALLS GIN

Table 2. Plant observation results from the center pivot irrigated XtendFlex cotton variety trial, Patterson Farm, Spearman, TX, 2020.

Entry	Final population	Stand establishment	Vigor	Nodes above white flower			Plant height			Nodes above cracked boll	Storm resistance
				Early bloom	+3 weeks	+5 weeks	Early bloom	+3 weeks	+5 weeks		
	plants/acre	%	1-5 visual scale, 5 best	count			inches			count	1-9 visual scale, 9 tight
	28-May	28-May	28-May	28-Jul	13-Aug	27-Aug	28-Jul	13-Aug	27-Aug	30-Sep	27-Nov
DP 1820 B3XF	46,174	71.0	3.7	8.1	5.9	1.5	25.0	27.7	29.1	7.8	4.7
DP 2012 B3XF	53,724	82.6	4.2	8.1	5.5	1.3	24.7	28.4	28.9	8.2	4.5
DP 2020 B3XF	52,853	81.3	4.0	8.3	5.0	0.5	24.4	26.6	27.1	7.2	4.7
NG 2982 B3XF	51,401	79.1	4.2	7.6	4.2	0.3	23.1	25.1	25.7	3.9	6.2
NG 3930 B3XF	58,371	89.8	4.5	7.5	4.5	0.6	24.0	27.9	27.4	6.4	4.5
ST 4480 B3XF	49,077	75.5	4.2	9.3	5.6	1.3	23.1	26.0	27.1	8.6	5.3
Test average	51,933	79.9	4.1	8.2	5.1	0.9	24.1	27.0	27.6	7.0	5.0
CV, %	6.1	6.1	6.9	4.8	9.9	50.7	3.6	4.3	1.2	13.5	4.4
OSL	0.0133	0.0137	0.0808	0.0026	0.0127	0.0298	0.0849	0.0420	0.0038	0.0012	0.0001
LSD	4,706	7.3	0.4	0.6	0.8	0.7	1.3	1.7	3.0	1.4	0.3

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.10 level.

ADOBE WALLS GIN

Table 3. Commercial classing data for the center pivot irrigated XtendFlex cotton variety trial, Patterson Farm, Spearman, TX, 2020.

Variety and Bale Number	Color Grade-Quadrant grade-quadrant	Color digit 1	Color digit 2	Leaf grade	Staple 32nds inch	Micronaire units	Extraneous matter	Remarks --	Strength g/tex	Rd %	+b %	Trash % area	Uniformity %	Length 100ths inch	Loan rate cents/lb
DP 1820 B3XF															
9078125	31-1	3	1	5	38	3.6	.	.	33.6	78.5	7.7	6	80.3	118	53.25
9078126	31-1	3	1	4	38	3.6	.	.	31.5	78.8	7.8	4	83.0	120	55.10
9078127	31-1	3	1	4	38	3.5	.	.	33.3	79.2	7.8	5	81.2	120	55.05
9078128	31-1	3	1	3	41	3.0	.	.	33.0	80.4	7.9	3	81.3	127	50.25
9078129	31-2	3	1	4	39	2.8	11	level 1 bark	30.8	77.6	7.8	6	80.2	122	42.35
9078130	31-1	3	1	4	40	2.8	11	level 1 bark	33.9	77.5	7.9	6	80.2	124	42.60
9078131	21-1	2	1	3	40	2.9	11	level 1 bark	32.8	79.6	9.0	4	79.6	126	43.95
9078132	31-2	3	1	5	40	2.8	11	level 1 bark	30.9	77.3	7.7	8	80.4	124	40.55
9078133	31-2	3	1	4	40	2.9	11	level 1 bark	34.2	77.8	7.6	7	80.8	126	42.60
9078134	31-1	3	1	4	39	3.0	11	level 1 bark	32.5	78.7	7.5	5	80.2	123	45.15
9078135	31-1	3	1	3	40	2.9	.	.	32.6	80.3	7.5	4	80.0	124	47.60
Average	--	2.9	1.0	3.9	39.4	3.1	6/11 bales	level 1 bark	32.6	78.7	7.8	5.3	80.7	123.1	47.13
DP 2012 B3XF															
9078136	31-1	3	1	4	37	3.2	11	level 1 bark	31.0	79.4	7.8	6	80.3	115	45.15
9078137	31-1	3	1	4	37	3.1	11	level 1 bark	27.3	78.9	8.1	4	79.3	117	44.20
9078138	31-2	3	1	5	37	3.1	11	level 1 bark	30.1	76.9	8.2	7	80.8	117	43.15
9078139	31-2	3	1	4	37	2.7	11	level 1 bark	29.8	76.5	8.2	7	78.8	116	41.55
9078140	31-2	3	1	4	37	2.8	11	level 1 bark	28.1	77.4	8.1	6	79.8	116	41.60
9078141	41-1	4	1	6	36	2.8	11	level 1 bark	27.8	76.3	7.9	12	79.7	113	36.10
9078142	31-2	3	1	5	36	2.7	11	level 1 bark	28.4	76.8	8.0	9	78.1	113	39.60
9078143	31-2	3	1	5	37	2.8	11	level 1 bark	29.0	76.9	7.8	9	78.6	117	39.75
9078144	31-2	3	1	4	37	2.7	11	level 1 bark	28.3	77.4	7.7	7	80.2	117	42.10
Average	--	3.1	1.0	4.6	36.8	2.9	9/9 bales	level 1 bark	28.9	77.4	8.0	7.4	79.5	115.7	41.47
DP 2020 B3XF															
9078145	31-1	3	1	3	38	2.9	11	level 1 bark	30.9	78.9	8.0	4	80.3	118	44.00
9078146	31-1	3	1	3	37	3.3	11	level 1 bark	29.6	79.1	8.0	4	80.6	117	48.05
9078147	31-1	3	1	4	37	3.0	.	.	28.5	79.0	8.3	4	79.3	116	47.60
9078148	31-1	3	1	5	37	2.9	11	level 1 bark	31.3	77.8	8.1	7	79.1	117	40.25
9078149	31-2	3	1	5	37	2.8	11	level 1 bark	30.0	76.8	8.1	6	79.8	116	40.05
9078150	31-2	3	1	5	38	2.5	11	level 1 bark	29.1	77.2	8.0	7	78.5	120	34.85
9078151	31-2	3	1	4	37	2.7	11	level 1 bark	29.3	77.0	7.9	6	79.8	117	41.65
9078152	31-2	3	1	6	37	2.5	11	level 1 bark	29.1	76.9	7.7	10	78.2	116	31.65
9078153	31-2	3	1	5	39	2.9	11	level 1 bark	28.2	77.9	7.7	7	79.2	121	39.80
Average	--	3.0	1.0	4.4	37.4	2.8	8/9 bales	level 1 bark	29.6	77.8	8.0	6.1	79.4	117.6	40.88

ADOBE WALLS GIN

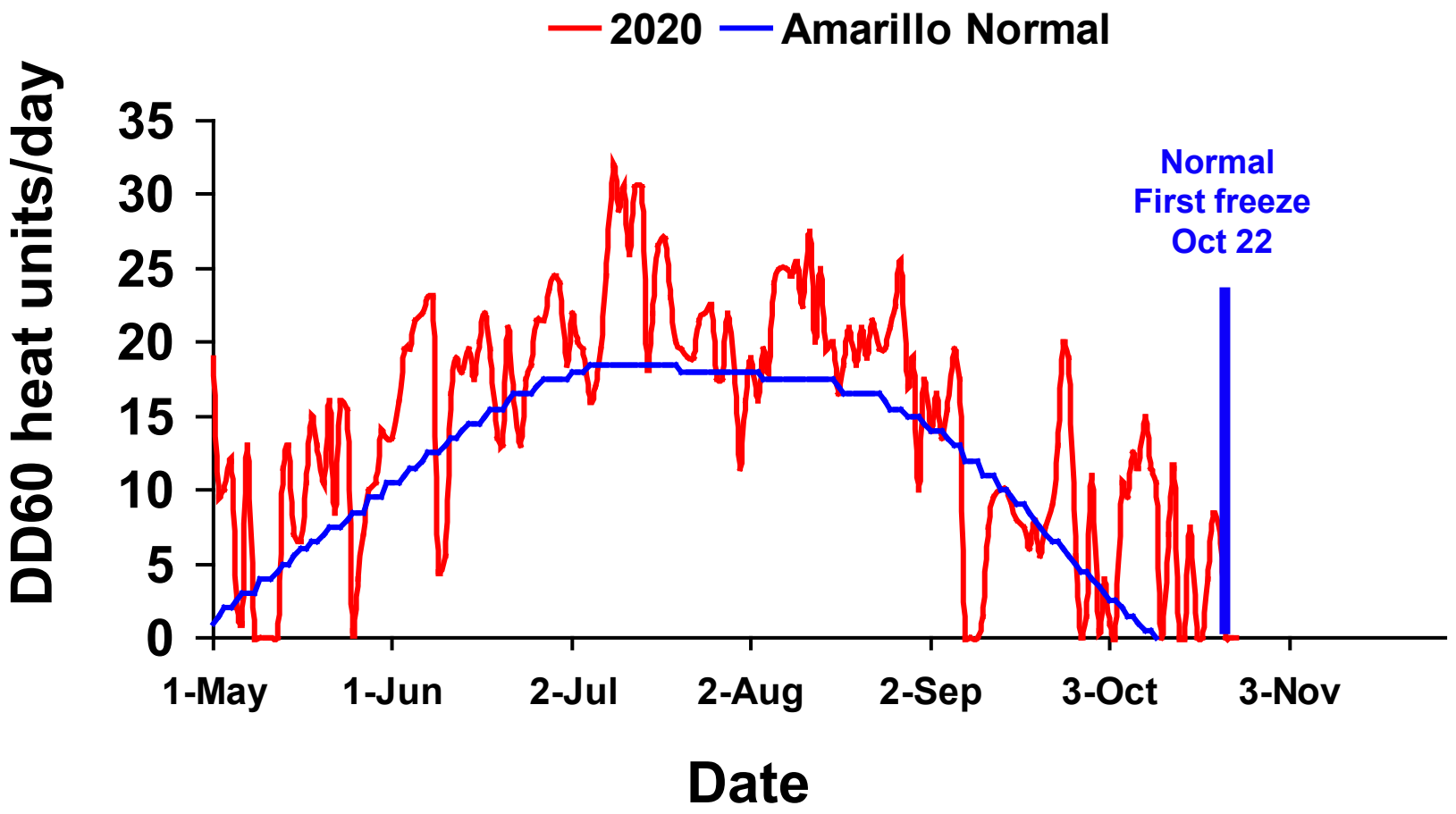
Table 3 (continued). Commercial classing data for the center pivot irrigated XtendFlex cotton variety trial, Patterson Farm, Spearman, TX, 2020.

Variety and Bale Number	Color Grade-Quadrant grade-quadrant	Color digit 1	Color digit 2	Leaf grade	Staple 32nds inch	Micronaire units	Extraneous matter	Remarks --	Strength g/tex	Rd %	+b %	Trash % area	Uniformity %	Length 100ths inch	Loan rate cents/lb
NG 2982 B3XF															
9078154	51-1	5	1	8	37	2.7	11	level 1 bark	31.3	72.3	6.3	15	79.5	116	19.50
9078155	51-1	5	1	8	36	3.4	11	level 1 bark	31.4	72.4	6.7	14	82.0	113	24.45
9078156	51-1	5	1	8	37	3.3	.	.	33.1	72.5	6.7	15	81.9	115	27.85
9078157	51-1	5	1	8	38	3.3	11	level 1 bark	32.6	72.5	6.6	13	81.5	120	24.40
9078158	51-1	5	1	8	38	3.1	11	level 1 bark	34.1	71.8	7.2	18	82.8	120	22.70
9078159	51-1	5	1	8	39	2.9	11	level 1 bark	32.4	71.4	6.9	16	82.3	122	20.05
9078160	51-1	5	1	8	38	2.8	11	level 1 bark	33.4	71.6	7.0	20	82.3	118	20.10
9078161	51-1	5	1	8	38	3.1	11	level 1 bark	33.1	71.2	6.9	19	81.4	118	22.65
9078162	51-1	5	1	8	39	2.9	11	level 1 bark	34.2	70.8	6.8	24	81.5	121	20.05
9078163	51-1	5	1	8	38	2.9	11	level 1 bark	32.2	72.7	7.0	17	81.8	120	20.00
9078164	51-1	5	1	8	38	3.0	11	level 1 bark	33.7	71.7	6.6	19	82.3	119	22.70
Average	--	5.0	1.0	8.0	37.8	3.0	10/11 bales	level 1 bark	32.9	71.9	6.8	17.3	81.8	118.4	22.22
NG 3930 B3XF															
9078165	41-1	4	1	5	38	3.5	11	level 1 bark	30.7	77.0	7.4	10	81.1	118	48.60
9078166	31-1	3	1	4	38	3.5	11	level 1 bark	30.3	77.5	8.1	6	82.5	120	51.45
9078167	31-1	3	1	5	39	3.6	.	.	29.7	77.5	7.9	7	81.6	121	52.80
9078168	31-2	3	1	5	38	3.2	11	level 1 bark	30.2	77.2	8.0	8	79.9	119	42.65
9078169	31-2	3	1	5	38	3.2	11	level 1 bark	30.7	76.3	8.1	8	81.0	119	43.15
9078170	41-1	4	1	5	38	2.9	11	level 1 bark	29.8	76.3	8.0	8	78.6	119	38.75
9078171	41-1	4	1	5	38	2.9	11	level 1 bark	29.8	76.3	8.0	8	78.6	119	38.75
9078172	31-2	3	1	5	39	2.8	11	level 1 bark	31.4	77.1	7.9	8	80.7	121	40.75
9078173	41-1	4	1	6	38	3.1	11	level 1 bark	28.8	76.3	7.8	10	80.9	120	39.20
9078174	41-1	4	1	6	38	2.8	11	level 1 bark	29.9	75.7	7.9	11	81.3	120	36.65
9078175	31-1	3	1	5	38	3.0	11	level 1 bark	30.4	77.6	7.9	9	79.8	118	42.65
Average	--	3.5	1.0	5.1	38.2	3.1	10/11 bales	level 1 bark	30.2	76.8	7.9	8.5	80.5	119.5	43.22
ST 4480 B3XF															
9078176	31-2	3	1	4	37	3.3	.	.	30.9	80.6	6.4	6	79.9	117	49.65
9078177	41-1	4	1	5	38	3.2	11	level 1 bark	30.6	79.2	6.7	9	80.9	119	42.15
9078178	41-1	4	1	5	39	2.8	11	level 1 bark	31.1	77.1	7.1	8	80.1	121	39.75
9078179	41-1	4	1	6	37	2.6	11	level 1 bark	29.9	75.7	7.3	11	78.1	117	31.15
9078180	41-1	4	1	7	39	3.0	11	level 1 bark	30.4	75.1	7.2	12	80.8	122	38.10
9078181	41-1	4	1	6	38	2.9	11	level 1 bark	32.7	76.0	7.4	9	78.8	120	36.45
9078182	41-1	4	1	7	39	2.9	11	level 1 bark	32.1	74.5	7.3	13	80.7	123	35.70
9078183	41-1	4	1	7	38	2.8	11	level 1 bark	31.8	74.8	7.2	14	80.5	120	35.70
9078184	41-1	4	1	7	38	2.6	11	level 1 bark	30.7	76.4	7.2	13	78.6	119	30.00
Average	--	3.9	1.0	6.0	38.1	2.9	8/9 bales	level 1 bark	31.1	76.6	7.1	10.6	79.8	119.8	37.63

Appendix

Amarillo 2020 Cotton Heat Units and Weather Data

Amarillo
30-Year Normal (1981-2010) and 2020
Daily Heat Units



Total Accumulated Heat Units
From May 1 through Hard Freeze:

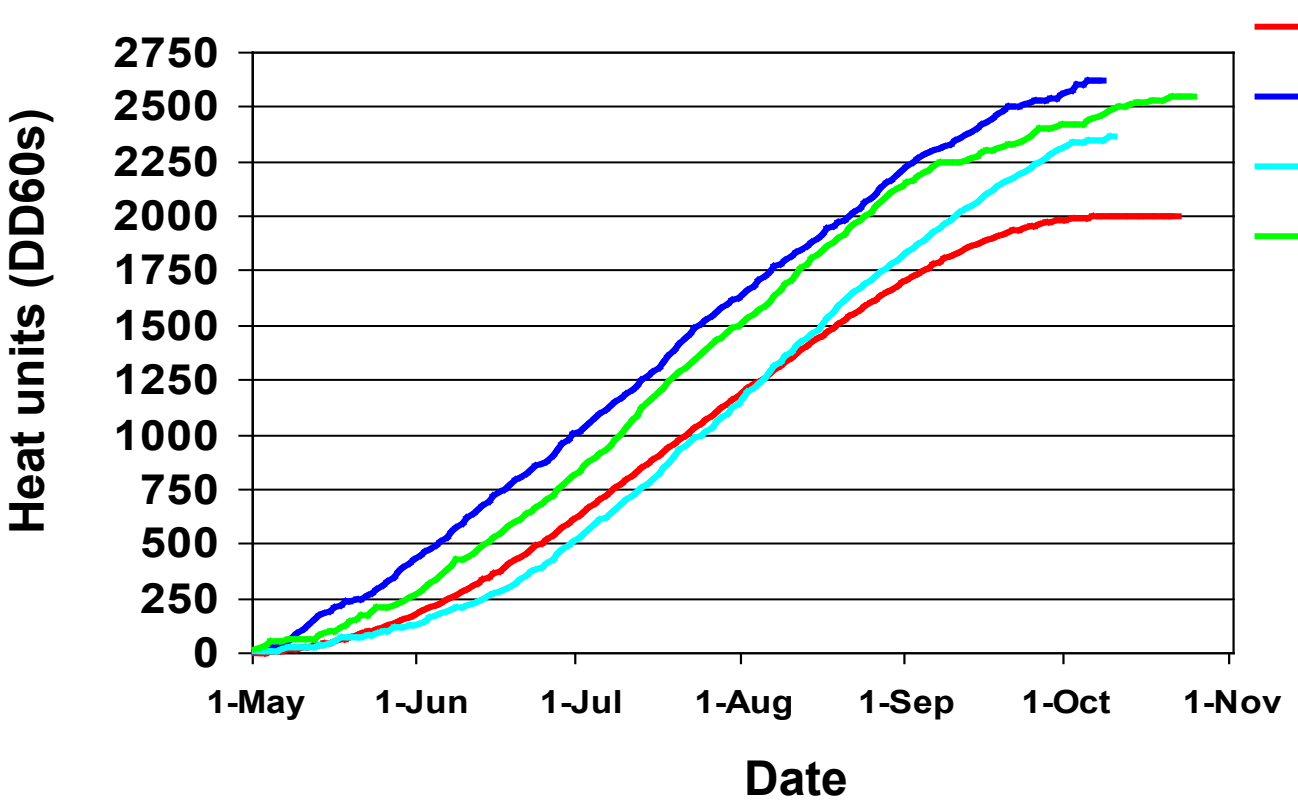
Normal: 2001
2020: 2552
% of normal: +28%

July had 10 days of 100 degrees or greater

Aug had 7 days of 100 degrees or greater

Hard freeze on Oct 25

Amarillo 30-Yr Normal (1981-2010) vs. 2018, 2019, and 2020 Cotton Heat Unit Accumulation for May 1 Through First Hard Freeze



1981-2010 (2001)
2018 (2621)
2019 (2362)
2020 (2552)

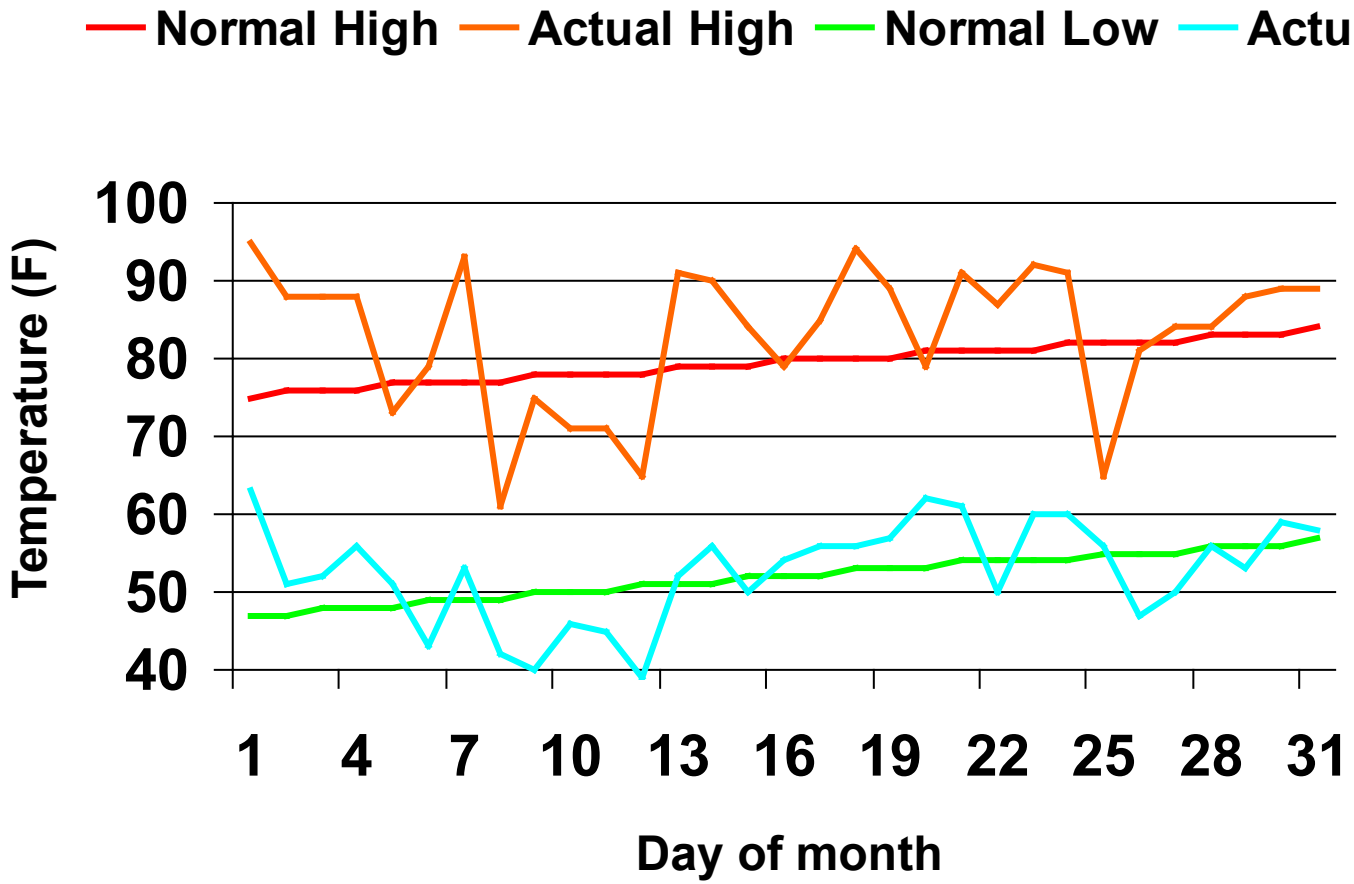
From May 1 through First Hard Freeze
Normal: 2001

2020: 2552
% of Normal: +28%

2019: 2362
% of Normal: +18%

2018: 2621
% of Normal: +31%

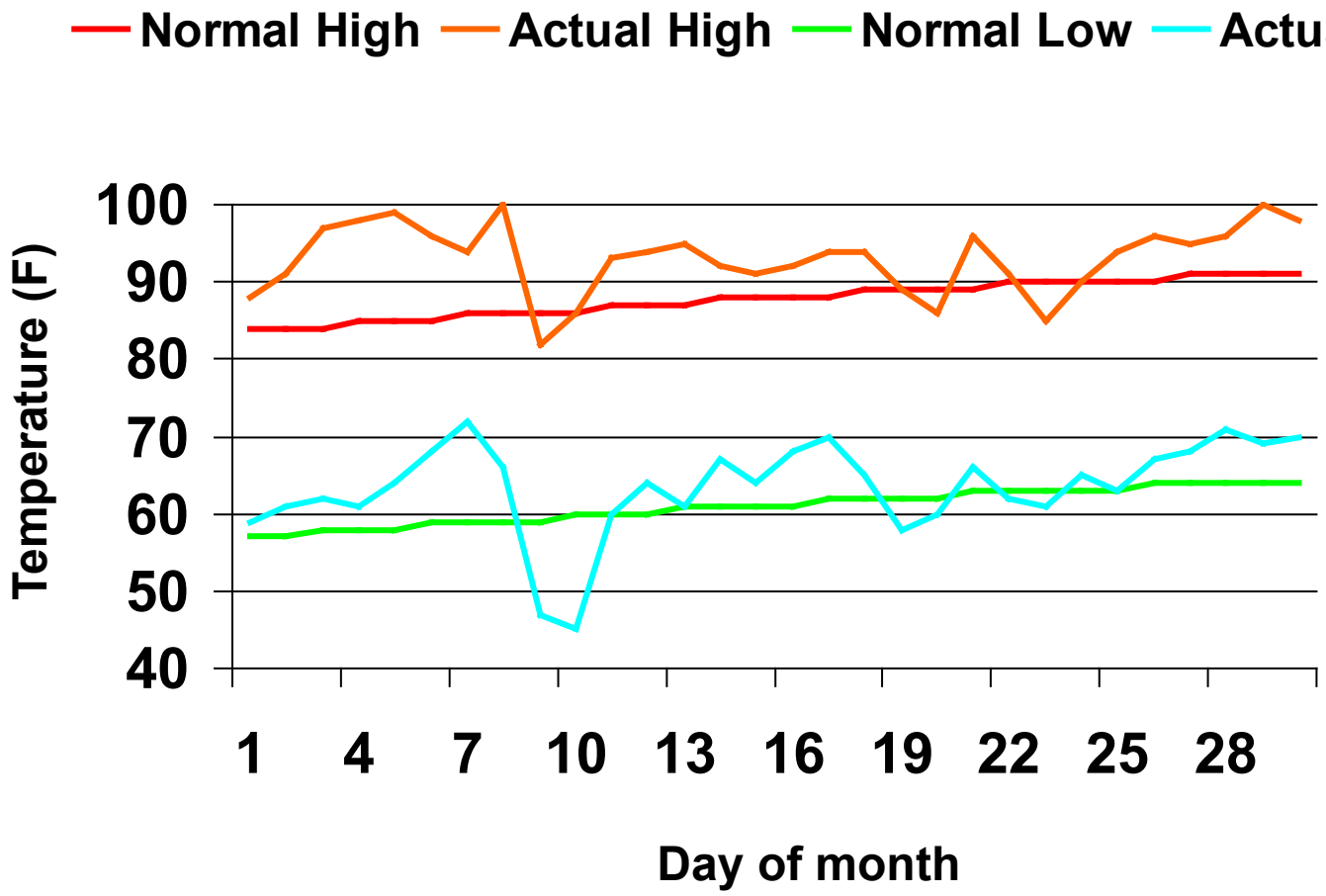
Amarillo
30-Yr Normal (1981-2010) and May 2020 Air Temperatures



Heat Units

Normal: 177
2020: 269
% of normal: +52

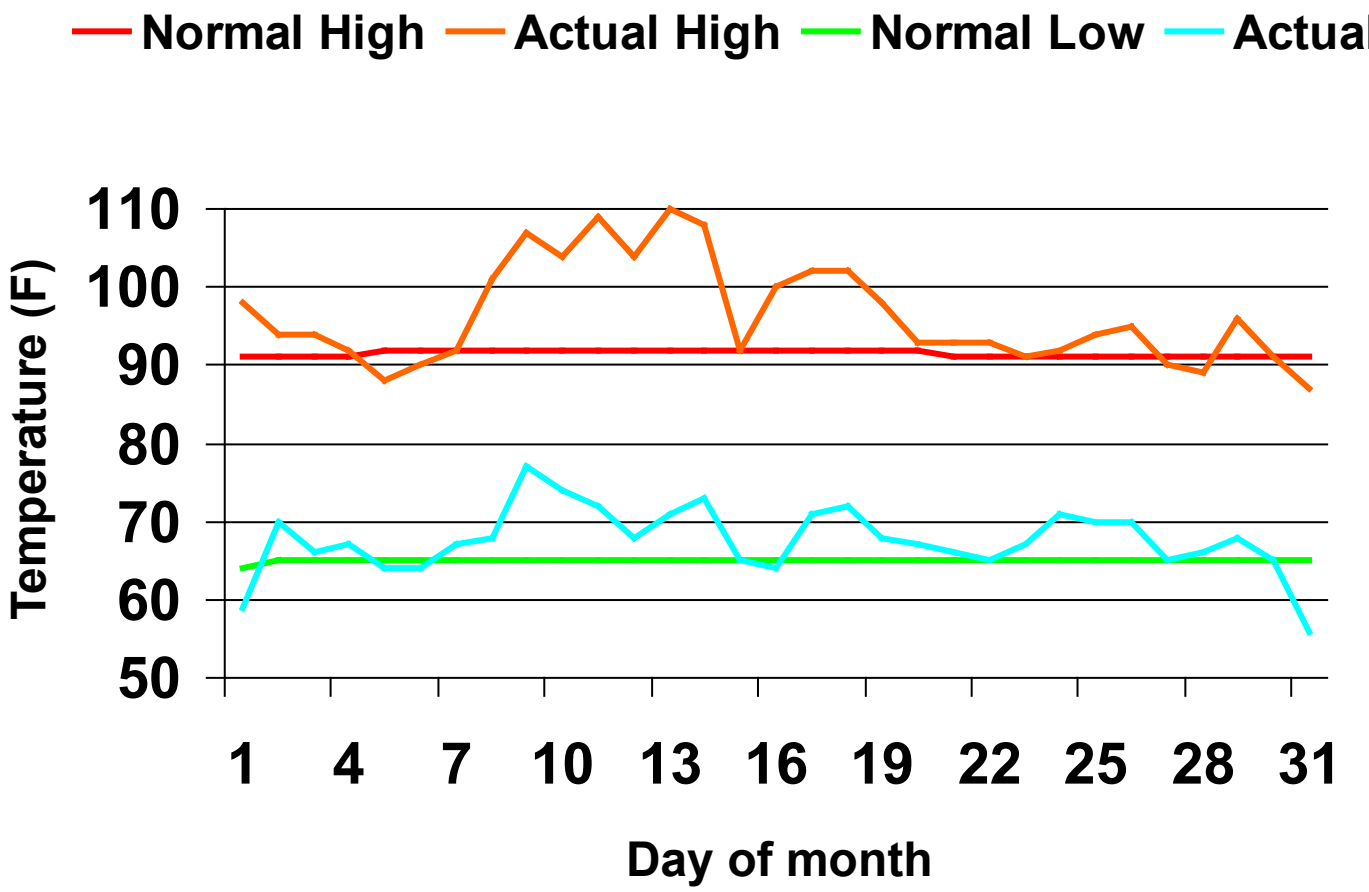
Amarillo
30-Yr Normal (1981-2010) and June 2020 Air Temperatures



Heat Units

Normal total: 433
2020: 548
% of normal: +27

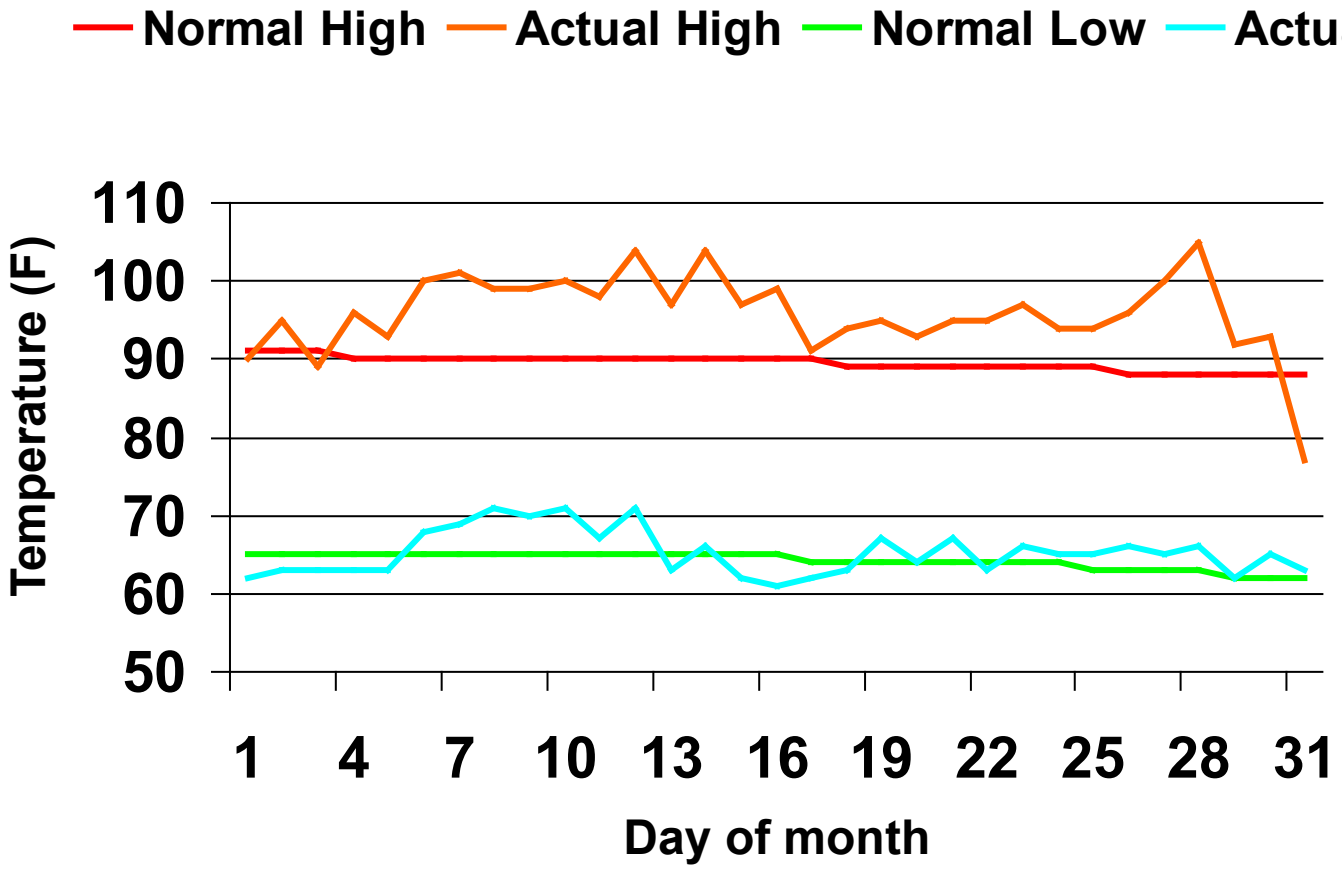
Amarillo
30-Yr Normal (1981-2010) and July 2020 Air Temperatures



Heat Units

Normal total: 566
2020: 683
% of normal: +21

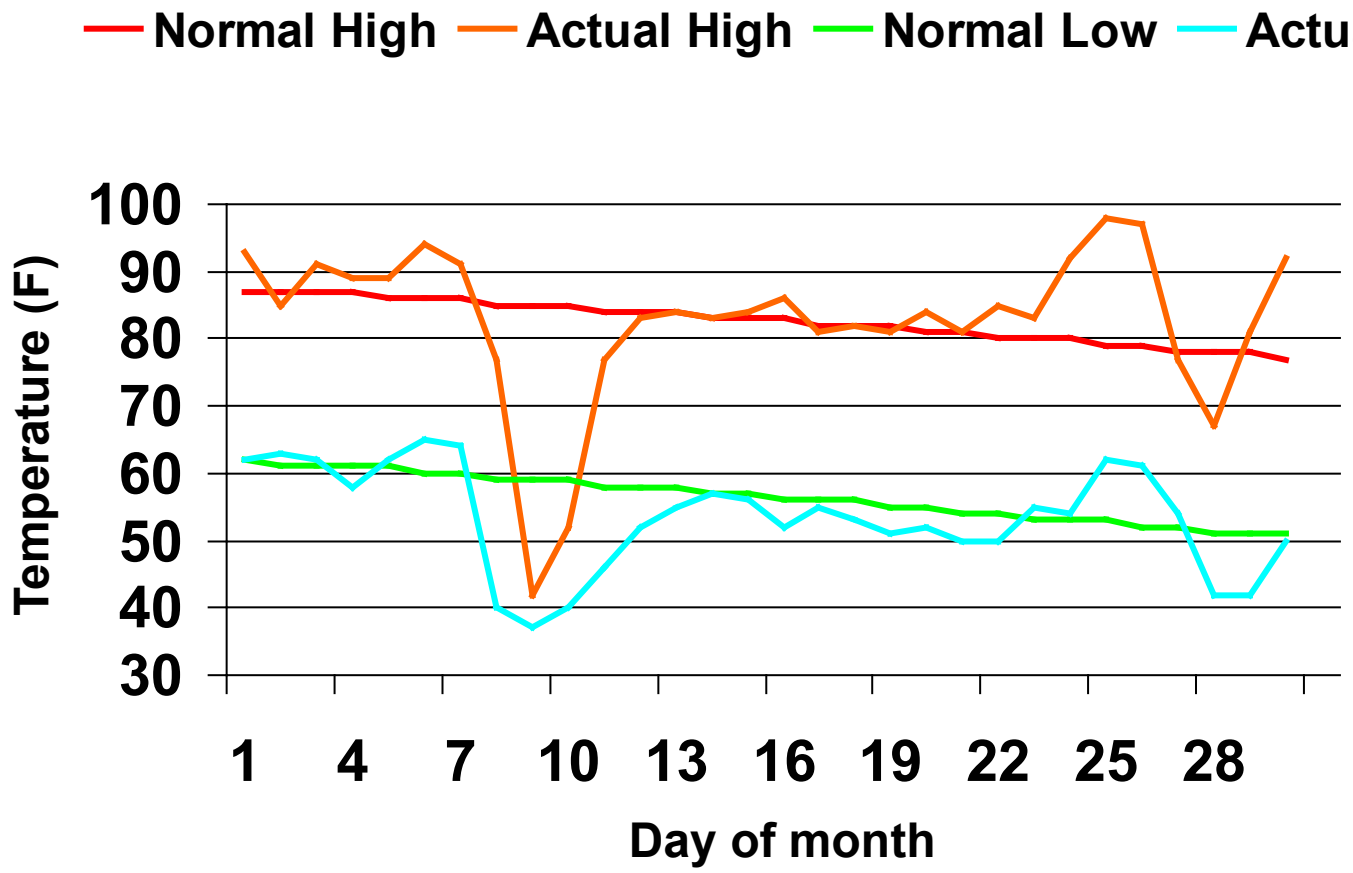
Amarillo
30-Yr Normal (1981-2010) and August 2020 Air Temperatures



Heat Units

Normal for Month: 522
2020: 637
% of normal: +22

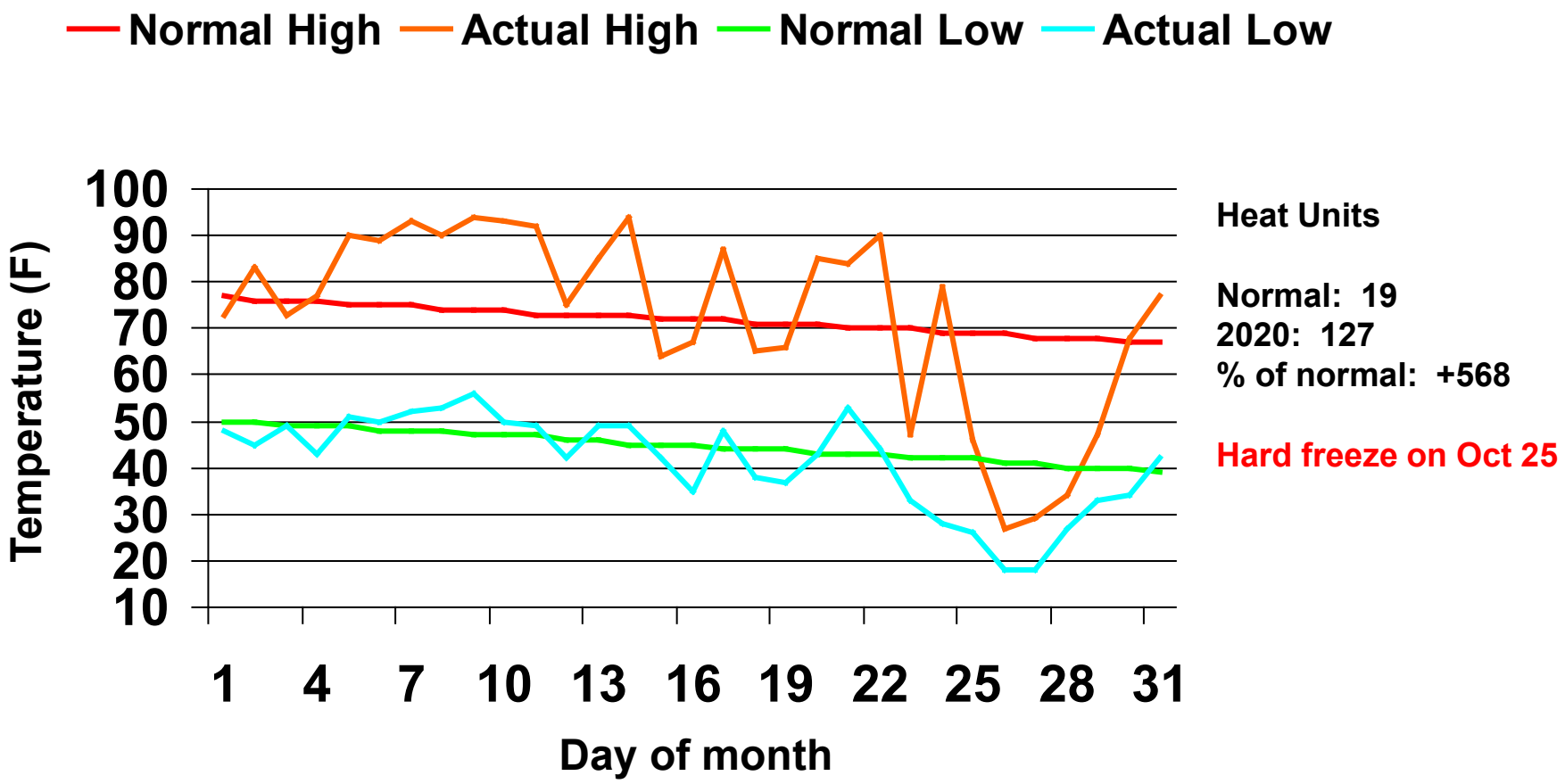
Amarillo
30-Yr Normal (1981-2010) and September 2020 Air Temperatures



Heat Units

Normal for Month: 286
2020: 283
% of normal: -1

Amarillo
30-Yr Normal (1981-2010) and October 2020 Air Temperatures



Heat Units

Normal: 19
2020: 127
% of normal: +568

Hard freeze on Oct 25